

ABSTRACT

Methods are discussed for forming a localized halo structure and a retrograde profile in a substrate of a semiconductor device. The method comprises providing a gate structure over the semiconductor substrate, wherein a dopant material is implanted at an angle around the gate structure to form a halo structure in a source/drain region of the substrate and underlying a portion of the gate structure. A trench is formed in the source/drain region of the semiconductor substrate thereby removing at least a portion of the halo structure in the source/drain region. A silicon material layer is then formed in the trench using an epitaxial deposition.